of spirit-levelling in England and Wales, and in Scotland, for which Clarke was mainly responsible. During this year he was appointed, with two others, to meet certain French officers and draw up a scheme for connecting the triangulations of England and France. In 1862 he observed at several of the English stations of the connection, and in 1863 published the account of the completed work.

In 1860 the Russian Government invited the cooperation of the Governments of Prussia, Belgium, France, and England to cooperate in the measurement of the European longitudinal arc from Orsk to Valencia. A necessary preliminary was the intercomparison of the standards of length of the various countries affected. At the instigation of the English Government these standards were sent to Southampton, where they were compared by Clarke in a specially designed and built bar room. The result of this undertaking was published in 1866, and included in the series were 10-ft. bars for India and Australia. At the end of this volume is the second investigation which Clarke made as to the shape of the earth. In 1867 he published a pamphlet on the positions of the Feaghmain and Haverfordwest observatories, also in connection with the longitudinal arc.

In 1874 two standard yards were made for the United States of America by Messrs. Troughton and Simms, and at the express desire of the United States Government, Clarke carried out the determination of their lengths. In 1880 appeared his "Geodesy," a subject on which he had already contributed an article for the "Encyclopædia Britannica." This work has been translated into several languages.

In 1881 he retired as Lieut.-Colonel, after thirty-four years' service. Clarke's retirement was brought about by a sudden and unexpected order from the War Office to hold himself in readiness to proceed at short notice to Mauritius, and sever his connection with the Ordnance Survey. The national survey never suffered a severer loss. It took many years to recover.

The extent of the work done during those thirty-four years can only be appreciated by a study of the books he published, for they contain a mass of calculation which evidence great mathematical ability as well as great energy.

In 1883 Colonel Clarke was appointed delegate to the International Geodetic Congress in Rome in conjunction with the Astronomer Royal. In 1870 he was made a Companion of the Order of the Bath, and in 1887 he received the Royal Medal of the Royal Society, of which he was a Fellow. He was also a Fellow of the Royal Society of Edinburgh, of the Royal Astronomical Society, honorary member of the Cambridge Philosophical Society, and corresponding member of the Imperial Academy of Sciences of St. Petersburg.

Although he had for many years ceased to take an active part in the prosecution of his favourite subject, his name still remains, and will remain, a constant stimulus to a younger generation.

H. S. L. Winterbotham.

NOTES.

We regret to announce the death on February 13, in the sixty-first year of his age, of M. Alphonse Bertillon, director of the anthropological department of the Prefecture of Police in Paris. M. Bertillon, following the custom of his family, devoted himself to the study of human races. At the beginning of his career he paid particular attention to those characters of the body which might be used for the purposes of identification. In 1885, when he was in his thirty-second year, he published the first draft of his famous system of identification and registration of criminals under the name of "Instructions signalétiques." The principle on which his system rests is that no two individuals are alike in all their bodily measurements and proportions. In 1893 Bertillon's system was introduced to British prisons. The system which, in the hands of Bertillon himself and of his pupils, worked satisfactorily, proved to be untrustworthy when applied by a heterogeneous body of observers. Even in the hands of experts, exact measurement of the living body is difficult of attainment. Hence in 1901 Bertillon's system was replaced in this country by one founded on finger imprints, a method which had been developed in India by Sir Edward Henry. It is popularly supposed that M. Bertillon invented the system of identification by finger-prints, but this is an error. Dr. Henry Faulds, in Nature of October 28, 1880, indicated how finger-prints might be applied to ethnological classification; and his was the first printed communication upon the subject, though public and official use of finger-prints had been made by Sir William Herschel in India some years before. M. Bertillon added the finger-print method to his own about 1891, after its advantages had been urged by Sir Francis Galton. Although Bertillon's system has proved defective in practice, still the merit of realising that a scientific system of measurements and observations could be elaborated to serve the purposes of the State will always stand to his credit. Under his system an enormous number of observations of the utmost scientific value have been accumulated and placed at the disposal of anthropological students.

The first Guthrie Lecture of the Physical Society will be delivered by Prof. R. W. Wood, of Johns Hopkins University, Baltimore, at the Imperial College of Science, on Friday, February 27. The subject of the lecture will be "Radiation of Gas Molecules Excited by Light."

We understand from Messrs. Gurney and Jackson that Major Barrett-Hamilton's lamented death, referred to last week (p. 667), will not cause any break in the publication of his valuable work on "British Mammals," as Mr. Martin C. Hinton has agreed to continue and complete the work.

On Saturday, February 28, Sir J. J. Thomson will begin a course of six lectures at the Royal Institution on recent discoveries in physical science. On Tuesday, March 3, Sir J. H. Biles will deliver the first of three lectures on modern ships: (1) "Smooth-water Sailing," (2) "Ocean Travel," (3) "The War

Navy"; and on Thursday, March 5, Prof. C. F. Jenkin will begin a course of three lectures on heat and cold. The Friday evening discourse on February 27 will be delivered by Prof. W. A. Bone on surface combustion.

THE sea-fish hatching season at the Port Erin Biological Station has commenced earlier than usual this year, and seems to promise well. The first few hundreds of plaice eggs were found on the surface of the pond on January 28, and on February 3 embryos at least a week old were obtained. The pond was systematically skimmed for the first time on February 5, and a haul resulted of more than 200,000 fertilised plaice eggs, which are now in the hatching boxes. In recent years the first fertilised eggs have generally been obtained on some date between the middle of February and the first week of March, so the present season seems to be at least a fortnight earlier than usual.

AT the anniversary meeting of the Royal Astronomical Society, held on February 13, the following officers and council were elected for the current year:—*President,* Major E. H. Hills; *Vice-Presidents,* Dr. F. W. Dyson, Dr. J. W. L. Glaisher, Prof. H. F. Newall, and Prof. H. H. Turner; *Treasurer,* Mr. E. B. Knobel; *Secretaries,* Prof. A. S. Eddington and Prof. A. Fowler; *Foreign Secretary,* Prof. Arthur Schuster; *Council,* Dr. S. Chapman, Sir W. H. M. Christie, Rev. A. L. Cortie, S.J., Dr. A. C. D. Crommelin, Mr. W. Heath, Mr. J. H. Jeans, Dr. W. H. Maw, Prof J. W. Nicholson, Rev. T. E. R. Phillips, Dr. A. A. Rambaut, Prof. R. A. Sampson, and Mr. F. J. M. Stratton.

THE tenth annual meeting of the Association of American Geographers was held at Princeton at the beginning of last month. Mr. A. P. Brigham was elected president for 1914. One of the most important features of the meeting was the adoption by the association of the plan of cooperation proposed by the American Geographical Society. The plan provides for (1) a joint research committee of the two organisations to administer a joint research fund; (2) a joint meeting in New York each spring; (3) the publication by the association in collaboration with the American Geographical Society of the annals of the association; (4) an interchange of the publications of the two societies.

FROM numerous cuttings from the issues of the Manila Press for December 19 last which have reached us, we learn that the Bill introduced into the local Assembly, and intended to reduce the expenses of the Philippine Weather Bureau, has not been favourably received. Father Algué, the director of the bureau, who has presided over its activities for many years with conspicuous success, was given the opportunity on December 18 of laying before the Upper House, or Commission, as it is called, particulars as to the work of the bureau, and the small cost at which it is conducted. Commenting on Father Algué's statement the next day, the *Manila Daily Bulletin,* instead of supporting the suggested retrenchment, said "to the average man it should appear strange that no attempt is being made to increase the salaries of Father Algué and his entire staff at least 100 per cent."

WE recently announced the issue by Messrs. Macmillan of a new publication, *Ancient Egypt.* We have since received the first number of *The Journal of Egyptian Archaeology,* issued by the Egypt Exploration Fund. The two publications, though devoted to similar subjects, are so different in matter and *format* that there is ample room for both. In the latter the article of most general interest is that by Prof. Sayce on the date of Stonehenge. He directs attention to certain beads, now in the museum at Devizes, which he identifies as Egyptian, of the period 1450–1250 B.C. Mr. H. R. Hall points out that the same identification had already been made by him in the third volume of "The Eleventh Dynasty Temple at Deir-el-Bahari" (thirty-second memoir of the Egyptian Exploration Fund). This identification is not, of course, conclusive as to the exact date of the barrow. But it corresponds fairly closely with Prof. Gowland's conclusions derived from his excavations in the course of the re-erection of a fallen pillar. The evidence would thus assign the erection of Stonehenge to the fourteenth century before our era.

WE regret to announce the death on February 7, in her fifty-fourth year, of Dr. Julia Cock, consulting surgeon to the New Hospital for Women and Dean of the London (Royal Free Hospital) School of Medicine for Women. As a girl, Miss Julia Cock joined the small band of pioneer women who opened the medical profession to women. She had a distinguished career as a student, and obtained honours in her final examination. In 1887, Dr. Cock was appointed a member of the out-patient staff of the New Hospital for Women, and, in 1892, she became full physician to the hospital, round which her professional interests henceforth centred. To the end of her life she was a student, humble and eager to learn, a constant reader, untiring in her enthusiasm and devotion, an accurate observer, a magnificent clinical teacher. Dr. Cock did not value popularity, and never sought for personal recognition. She believed that "so long as good work is done, it does not matter who does it." For thirteen years she was joint lecturer in medicine at the London School of Medicine for Women. For eleven years she was dean of the school, and the high position taken by it in recent years is largely due to her administrative ability and statesmanship. She contributed valuable articles on various subjects to the literature of medical science.

THE death of Prof. H. F. Rosenbusch, on January 20, 1914, at the advanced age of seventy-eight years, removes one of the most influential authors from the field of mineralogy and petrology. It is remarkable that when Zirkel published his great work on petrography in 1866, the study of thin slices of rocks under the microscope was not appreciated as an aid to research. Seven years later, Rosenbusch had no difficulty in persuading geologists of the importance of "microscopic physiography," and a band of pupils gathered at Strassburg, and later at Heidelberg, who rivalled those of Werner in carrying their master's views throughout the world. The stimulating publications of Lévy and Lacroix, working on absolutely independent lines on the other side of the Rhine, established the new methods with equal firmness; and for a time the enthusiastic study of rock-structure threatened to remove geologists from observation in the field. While Rosenbusch issued successive editions of his great work, "Die mikroskopische Physiographie der Mineralien und Gesteine," the latest being in conjunction with Dr. Wülfing in 1905–7, he also summarised admirably the characters of rocks in his "Elemente der Gesteinslehre," published in 1900. He was responsible for many changes and redefinitions in nomenclature, which have been promulgated by the weight of authority rather than by the light of reason; but the exactitude of thought and method brought by him into a subject that, since 1825, had fallen from its high estate, has earned the gratitude of petrologists in every land.

In the Transactions of the East Riding Antiquarian Society for 1912, which has recently been published, Mr. T. Sheppard contributes a valuable paper on East Yorkshire history in plan and chart. Between Bridlington and Spurn Point, a distance of some thirty miles, the land is being worn awav at a rate varying from a few feet to more than 20 ft. per annum. The continuous changes in the coast-line are well illustrated by reproductions of a number of maps and charts, beginning with those of Leland and Lord Burleigh, in the time of Henry VIII., down to that by the late Mr. J. R. Boyle in 1889, showing the sites of the lost towns on the Humber.

A PAMPHLET by Prof. Ernst Schwalbe, entitled "Die Entstehung des Lebendigen," has just been published by Mr. Gustav Fischer, Jena. After a summary of the writings on the subject from Aristotle onwards, the author expresses the opinion that we are completely ignorant as to the origin of life, but he inclines to the view that it is supernatural.

In Lieferung 40 (pp. 1–37) of Dr. Schulze's "Das Tierreich" (Friedländer und Sohn, Berlin), Dr. G. Neumann, of Dresden, treats in considerable detail and in masterly style of the second division of the salpoid tunicates, constituting the groups Cyclomyaria and Pyrosomida. The diagrams illustrating the complex structure of these organisms seem all that could be desired, as are likewise the definitions of the various groups.

We have received a copy of *The Canadian Entomological Record* for 1912, published in the report of the Entomological Society of Ontario for that year, in which Mr. Arthur Gibson, chief assistant entomologist to the Department of Agriculture, records the most notable species of insects captured in the Dominion during the period under review, inclusive of those described as new. Another paper contributed by the entomological division of the Department of Agriculture, Ottawa—in this instance to vol. vi. of the Annals of the Entomological Society of America—records observations made by J. D. Tothill on variation in flies of the genus Lucilia. This variation embraces size, colour, and the mode of arrangement and number of the cephalic bristles. As the result of this study, it appears "that all the new characters used by Mr. Townsend for the erection of the ten supposedly distinct species are shown to come within the limits of variation of the North American species of Lucilia as recognised by Hough."

In January, 1912, Mr. C. W. Gilmore described, under the new generic and specific name of *Globidens alabamaënsis,* the remains of a mosasaurian reptile from the Upper Cretaceous of Alabama, characterised by the globular form of the cheek-teeth, that type of dentition having been previously unknown to exist in that group of lizard. By a curious coincidence, Prof. L. Dollo, of the Brussels Museum, received the imperfect remains of a lower jaw of a mosasaurian from the Maestricht Cretaceous, carrying three teeth of the same general type as those of the American specimen, but somewhat laterally compressed. He has described the Belgian specimen in *Archiv Biol.,* vol. xxviii., pp. 609–26) as a new species of the American genus under the name of *G. fraasi.* M. Dollo concludes that while the typical mosasaures (Mosasaurus) were surface swimmers, and fed on other vertebrates, the members of the genera Plioplatecarpus and Globidens were divers, the former feeding on belemnites and squids, and the latter on sea-urchins.

Many years ago the late Dr. W. T. Blanford asserted that the blackbuck (*Antilope cervicapra*) living on a spit of sand about thirty miles long between the salt Chilka Lake in Orissa, and the sea never drank water. With few exceptions, the statement was received with incredulity. That it may be practically true is, however, indicated by observations recorded by Dr. R. E. Drake-Brockman, in *The Field* of January 31 (vol. cxxiii., p. 244), relating to a herd of Pelzeln's gazelles (*Gazella pelzelni*), which have lived on the small island of Saad-ud-din, near Zeyla, Somaliland, since 1910. The usual annual rainfall is less than 3 in., and even when, as in 1911, it is considerably more, pools of water are only to be found for a few days after a heavy shower. The vegetation of the island is scanty. Dr. Drake-Brockman submits that "the result of the experiment sets at rest the question whether desert-loving antelopes can subsist without water save that which collects for a few days after a heavy shower of rain." Nothing is said with regard to the gazelles being able to obtain succulent roots or bulbs, such as those on which antelopes feed during the dry season in the Kalahari.

Under the title of *Mera Publications,* No. 1, we have received a copy of a paper by Messrs. Harold Swithinbank and G. E. Bullen on the scientific and economic aspects of the Cornish pilchard fishery, (1) "The Food and Feeding Habits of the Pilchard in Coastal Waters." In this are described some observations made on board the steam yacht *Mera* in 1913, and also certain results of inquiries made from 1905–7 off the Cornish coast. The authors conclude that the pilchard when feeding exercises some degree of selection, catching chiefly certain constituents of the zooplankton, such as copepods and larvæ of the higher crustacea, whilst other organisms, such as medusæ, are avoided. They further think that zooplankton is preferred to phytoplankton, and that there is a certain amount of evidence to show that feeding is largely undertaken at nightfall, when the surface distribution of some highly nutrient plankton species reaches a maximum. We understand that copies of the publication will be supplied free of charge to students of marine biology on application to Mr. G. E. Bullen, the Hertfordshire Museum, St. Albans.

WE have received part i. of the sixth year's issue of *Der Fischerbote,* the new German fishery journal. The number is one of considerable interest. In addition to several articles on general marine biological and fishery subjects, there is the continuation of a series of accounts of the development of British fishing ports; the article in the current number deals with Fleetwood. *Der Fischerbote,* which is published fortnightly, is edited by Fishery-Director H. Lübbert and Prof. Ehrenbaum, of the Hamburg Natural History Museum.

AN interesting study on heredity of skin colour in negro-white crosses is published by Dr. C. B. Davenport in No. 188 of the Publications of the Carnegie Institution (1913). The data, which include very careful observations on more than 600 individuals, were collected chiefly in Bermuda and Jamaica. The difficulties in exactly determining the grade of skin colour, and more especially in getting trustworthy information about the ancestry, are explained, and reason is given for regarding the results as generally trustworthy. It is concluded that the results obtained fit on the whole rather well with the hypothesis that the negro is homozygous for two factors for the production of black pigment, both of which are absent from the European. Since each of these factors may be present singly or in duplicate among the descendants of a cross between negro and white, there may be five conditions—none, one, two, three, or four of the factors being present. When the whole number of individuals examined is plotted in a polygon, there are, in fact, five maxima. It is concluded that the stories of the production of "black" offspring by two full whites with negro ancestry on one or both sides are mythical. There is a yellow pigment in the negro independent of the black, which may appear strongly in the paler hybrids. Eye-colour and hair-colour and form are dealt with more shortly. There is no correlation between skin-colour and hair-form, but strong correlation between skin- and hair-colour.

THE Ipswich and District Field Club, in vol. iv. of its journal, includes a good colour-printed geological map of the Gipping Valley, by Mr. P. G. H. Boswell, and an account by Mr. J. Reid Moir of a workshop of Aurignacian flint implements revealed in a brickfield to the north of Ipswich. The types of implement are illustrated, and it is pointed out that hitherto remains of this stage of culture have not been found in England outside caves. Fire is believed to have been employed for fracturing the flints.

A PRELIMINARY account of the rainfall of 1913, from observations at selected stations of the British Rainfall Organisation, pending the more exhaustive examination of all available data, is published in *Symons's Meteorological Magazine* for January. The general annual fall for the whole of the British Isles was 1 per cent. below the normal; Scotland had a deficiency of 6 per cent., England and Wales one of 2 per cent., while Ireland had an excess of 5 per cent. July was the driest month, with little more than one-third of the average rainfall; August was also dry, England and Wales having exactly half the average. The wettest month was April, with a general excess of 61 per cent.; in England and Wales the excess was 80 per cent. In Scotland March was the wettest month, excess 59 per cent.; in Ireland the maximum occurred in January, excess 74 per cent. In September several rainstorms of great intensity occurred, the most notable being those at Newcastle-on-Tyne on September 16, and at Doncaster on the following day. As regards the geographical distribution the most striking feature was the deficiency in the east and the excess in the west of the country.

THOSE of our readers who are interested in meteorology, and have followed the recent progress in that science, will probably have noticed several important changes in the popular *Daily Weather Report* issued by the Meteorological Office. In January, 1911, arrangements were made for lithographing the report at the new office, and advantage was taken of the change to revise, *inter alia,* the arrangement of the maps. In place of the two showing pressure and temperature at 7h. a.m. of the current day, the information was combined on a single map, and the normal distribution of sea temperature was indicated by the depth of tint of the blue colour used to mark a distinction between sea and land. The area of the map then extended northwards to just beyond the Arctic circle, and included the Icelandic stations and Bodö in Norway. But from January 1 of this year an important extension has been made in the area of the principal 7h. a.m. chart, showing the observations at Vardö (extreme north of Norway), and those of the important Arctic station in Spitsbergen, while the area in the west and south is (as before) such as to allow of the inclusion of observations at Madeira and of timely wireless messages. It may be mentioned that much useful information bearing on the remarkable extensions of the telegraphic weather service in the last few years (especially since 1905) will be found in a lecture by Mr. Lempfert on British weather forecasts (Quart. Journ. R. Met. Soc., July, 1913).

NEARLY half the December number of the Bulletin of the Bureau of Standards is occupied with a paper by Mr. F. W. Grover on the methods available for determining the terms of a Fourier series to represent any periodic function, such as an alternating-current wave. The method finally adopted is that given by Runge in 1903, and complete descriptions of the methods of calculation and schedules for carrying it out rapidly are given. The author hopes by this means to enable electrical engineers to undertake the necessary analysis of the curves with which they deal without too much time having to be spent in the work.

Some of the scientific and technical periodicals of Germany are beginning to use the symbols agreed on by the International Committee on units and symbols, and it may be useful to mention here some of the symbols adopted. Length l, mass m, time t, radius, r, volume V, velocity v, gravitational acceleration g, pressure p, temperature absolute T or θ, ordinary t, quantity of heat Q, specific heat at constant pressure c_p, at constant volume c_v, coefficient of linear expansion α, wave-length λ, intensity of magnetisation, $\mathfrak{J}$, magnetic field $\mathfrak{H}$, magnetic induction $\mathfrak{B}$, permeability μ susceptibility χ, electric current I, resistance R, electromotive force E, capacity C, quantity of electricity Q, self-inductance L.

The Institution of Electrical Engineers has issued a programme of the meetings to be held by its local sections until the end of May next. The seven sections are:—Birmingham, holding its meetings at the University there; Dublin, holding its meetings at the Royal College of Science; Manchester, meeting at the physical laboratory of the University; Newcastle, which, in addition to the meetings at the Armstrong College of Science, has arranged also three meetings at Middlesbrough; the Scottish, with meetings at Edinburgh and Glasgow; the Western, with meetings at Bristol and Cardiff; and the Yorkshire Local Section, meeting at the Philosophical Hall, Leeds.

In connection with wave-length and other measurements in wireless telegraphy, adjustable condensers are frequently employed, and in many cases the quantity to be measured varies with the square of the capacity of the condenser. For such purposes, therefore, an adjustable condenser following a square law should be useful, and Mr. W. Duddell, in a short paper in the Journal of the Institution of Electrical Engineers for February 2, describes the method he has used for working out the correct curve to give to the plates of a rotating sector condenser, with this object in view. The data obtained may save other experimenters from going through the work a second time.

The British Fire Prevention Committee have found it necessary to formulate a standard test and a model specification for portable chemical fire extinguishers owing to the fact that several fatalities have occurred through these appliances bursting when being operated. There is at the present moment an unfortunate tendency to put various types of "cheap-jack" appliances on the market, and the committee direct attention to the reprehensible method which is frequently adopted by makers or their agents in country towns and villages of making use of faked demonstration tests to sell such appliances. The specification can be obtained from the offices of the committee, 8 Waterloo Place, Pall Mall, S.W.

No. 13 of the Technologic Papers of the Bureau of Standards of the Department of Commerce of the United States deals with the question of electrolysis in concrete, and is an experimental investigation of the problem by Messrs. E. B. Rosa, Burton McCollum, and O. S. Peters. The report is illustrated by numerous photographs and tables of data, and fills 136 pages. Of the numerous theories that have been advanced to account for the cracking of reinforced concrete that one which attributes it to the oxidation of the iron anode following electrolytic corrosion has been fully established. The oxides formed occupy a volume which is 2·2 times as great as the original iron, and the pressure resulting from this causes the block to crack open. Many points of great interest to the architect and engineer are dealt with in full detail in the report.

Hitherto aëroplane problems have received very little attention from workers in pure science, and it is not so very long ago that an attempt by Prof. Herbert Chatley to investigate mathematically the stresses in the various parts of an aëroplane met with a very discouraging reception. We have now received a paper by Prof. H. Reissner on the strength of flying machines, published in the *Jahrbuch der wissenschaftlichen Gesellschaft für Flugtechnik*, vol. i., dealing with the general principles involved in the study of aëroplane stresses. As the author points out, the increasing use of aëroplanes in all kinds of weather, often driven at high speeds for racing purposes carrying heavier loads, and subjected to vibration for extended periods, has brought this question of safety into greatly increased prominence. Among various methods of testing strength, one consists in suspending the machine in an inverted position and loading its supporting surfaces with sand. Prof. Reissner advocates experiments in which aëroplanes are strained to the breaking point, although the cost of such tests would preclude them from being made except when a large number of machines of a particular type are being built. At the present time all aëroplanes have some of their parts strained beyond the elastic limits of the materials, a circumstance which greatly increases the difficulty of the problem.

Mr. Sijil Abdul-Ali dealt with the doctrine of the first matter as held by the alchemists, and particularly by Thomas Vaughan, in a paper read before the Alchemical Society on February 13. He pointed out that the alchemical quest was of a different nature from that pursued by the experimental chemist, and needed a different mental point of view for its appreciation. Alchemy, he said, had a secret tradition, and, in that light, a scriptural faith; it started with a theory of creation and a psychic doctrine, a symbolic presentation of which it sought in a chemical experiment. The lecture was mainly concerned with the doctrinal implications of this "first matter," and their significance for modern philosophy.

The sixteenth technological paper from the Bureau of Standards (Washington) deals with the manufacture of lime. It describes an attempt to study the effects of various impurities on the properties of lime, and to compare the efficiency of various types of manufacturing processes used in the transformation of limestone into slaked- and quick-lime. The brochure is a particularly interesting contribution to the literature of that neglected industry—lime burning; the pamphlet is of equal interest to the consumers—architects and builders—since they seek the best possible mortar, &c., for building purposes. The quality of the mortar is not only dependent upon efficient burning, but also on skilful slaking and proper mixing. The deterioration in the quality of quick- and slaked-lime with keeping also receives attention.

Another of Prof. H. B. Baker's interesting studies of the properties of purified substances is described in a recent issue of the Chemical Society's Journal, vol. ciii., p. 2060, in a paper published jointly with Mr. L. H. Parker. Two years ago, at a meeting of the Faraday Society, an experiment was shown in which water prepared under special conditions acted much more slowly than ordinary distilled water on sodium amalgam. It was remarkable that this difference persisted even after a considerable amount of caustic soda had been formed; it was therefore not due to the non-conducting properties of the special water, and has now been traced to the "catalytic action" of traces of hydrogen peroxide. These are present in ordinary samples of water, and in water prepared from pure hydrogen and oxygen in presence of palladium, but are destroyed by distilling from metallic vessels and superheating the steam. One sample of water prepared in this way in a platinum apparatus had no perceptible action on sodium amalgam in three hours, and liberated only 0·1 c.c. in four hours, 0·4 c.c. in five hours, and 0·6 c.c. in six hours. On the other hand, the addition of one part of hydrogen peroxide to 100,000 parts of another sample of water increased the amount of hydrogen liberated from 0 to 3·8 c.c. in one hour, and 4·1 to 32·4 c.c. in three hours, although it did not appreciably affect the conductivity of the water.

A catalogue of periodicals and publications of literary and scientific societies, including standard sets and library editions, which they have on sale, has been published by Messrs. W. Heffer and Sons, Ltd. An inspection of the catalogue suggests that men of science and librarians have here a good opportunity of completing their sets of transactions and of making additions to their libraries at a moderate cost.

A copy has been received from Cairo of the almanac for the year 1914 compiled in the Government Publications Office for the Egyptian Government. The object of the almanac is to furnish information likely to be useful to the various Government administrations in their relations with each other and also to the general public. In the section concerned with the Ministry of Finance, full particulars are given in connection with the Survey Department; details as to schools and colleges are included under the heading, Ministry of Education; and an exhaustive section, entitled "General Information," supplies up-to-date facts as to rainfall and other meteorological data, magnetic values, scientific societies, weights and measures, in addition to other matters of importance.

OUR ASTRONOMICAL COLUMN.

Detonating Fireball of January 19.—A considerable number of records of this object have now been received by Mr. W. F. Denning, and it is certain that the fireball descended to within a very small distance of the earth's surface, if indeed it did not actually fall to the ground. The observations are not sufficiently exact to indicate the precise spot where the meteor fell, if it came to earth, and the event might easily pass unnoticed if it occurred in a country place where no one happened to be near enough actually to witness it.

Several observers carefully timed the interval between the meteor's brilliant flash and explosion and the sound which followed. This was half a minute near Oxford and one minute a little further off in the same part, while at several other places the times are given as one minute to five minutes, according to the varying distance from the scene of the disruption. One minute's interval equals a distance of about twelve miles, and as part of this was horizontal distance and not all vertical height, it is clear the fireball was only a very few miles high at the time of its final outburst.

Inquiries should be instituted in the west part of Berkshire, near Lambourn, for it is possible evidence may be obtained as to the exact locality of the fall, if it occurred. The radiant of the meteor was south of Ursa Major, either at 132°+47°, or 154°+41° probably.

The Total Solar Eclipse of August 21 Next.—*The Observatory* for February publishes particulars of the provisional arrangements which have been made by the Joint Permanent Eclipse Committee with regard to the observations of the total solar eclipse of August 21 next. Under the auspices of the committee Prof. Fowler, Mr. W. E. Curtis, and Father Cortie, with Major Hills and Father O'Connor as volunteers, will be situated at or near Kiev. The first two-named, with Major Hills, will devote their attention to photographing the spectrum of the chromosphere during the partial phases with iron arc comparisons. The other two will take photographs of the corona and its spectrum, chiefly in the region of longer wave-lengths. The Royal Observatory of Greenwich will be represented by Mr. Jones and Mr. Davidson, who will attempt large-scale photographs of the corona, and its spectrum, with special reference to the ultra-violet region; they will be stationed at Minsk. The Solar Physics Observatory of Cambridge will send a party of three, namely, Prof. Newall, Messrs. Stratton and Butler, and this will be stationed at Feodosia, in the Crimea. Their programme will include direct photographs of the corona on large and small scales, the former for studies of "arches," and the latter for extensions. The chromospheric spectrum will be attacked with a concave grating without slit, for comparison with the slit spectra of Prof. Fowler's programme. Polariscopic observations will also be made.

The Absorption of Light in Space.—An ingenious method of trying to detect the absorption of light in space is that of photographing the spectra of stars which have similar spectra, but the stars themselves should be at very different distances from the earth. The spectrum of the more distant star should exhibit a greater absorption towards the violet than that of the nearer star, if such absorption be present in space. This method was proposed by Prof. Kapteyn, and a first attempt has been made by Mr. Walter S. Adams, using the Cassegrain spectrograph of the Mount Wilson Solar Observatory; his results are printed in the current number of *The Astrophysical Journal* (January, vol. xxix., No. 1). The choice of stars was facilitated by the use of the ample material previously accumulated for line of sight work, and the pairs finally compared had spectra which were similar line for line. Stars of various spectrum types were employed, and of the twenty pairs investigated seven pairs were of class K0, two from each of B8, G5, and G6, and one from each of A0, F4, F7, G8, K2, K4, and K6. While six pairs showed no appreciable difference between the